ROCKS and MINERALS

A Magazine for Mineralogists, Geologists and Collectors

Official Journal of the Rocks and Minerals Association

June, 1941

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THE ROCKS AND MINERALS ASSOCIATION

(Members All Over the World)

Organized in 1928 for the increase and dissemination of mineralogic knowledge

To stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

Ever since its foundation in 1928, the Rocks and Minerals Association has done much to promote the interest in mineralogy. It has sponsored outings, expeditions, formations of mineralogical clubs and the printing of many articles that have been a distinct contribution to mineralogy.

Those of our readers who are members of the Association can rightly feel that they too were sponsors of these many achievements that have helped to give mineralogy a national recognition. Among your frineds there must be many who would like to have a part in the Association's work—to share with you the personal satisfaction, the pleasure, and the benefits of membership. Will you give your friends this opportunity to join the Association by nominating them for membership?

Each new member helps to extend the Association's activities—helps to make your magazine larger, better, and more interesting, and above all assists in the dissemination of mineralogical knowledge.

Some advantages of membership: All members in good standing receive:

(1) **Rocks and Minerals**, a monthly magazine. (2) A member's identification card that secures the privileges of many mines, quarries, clubs, societies, museums, libraries. (3) The right to participate in outings and meetings arranged by the Association. (4) The right to display a certificate of membership and to place after their names a designation indicating their membership or to advertise membership on stationery, etc. (5) The distinction and the endorsement which comes from membership in the world's largest mineralogical society.

Mineralogical clubs which subscribe for **Rocks and Minerals** also become affiliated members of the Rocks and Mineral Association and enjoy all the advantages which such an affiliation affords.

A number of clubs hold membership in the Association, participate in the annual outings, and co-operate in many ways in furthering the aims and ambitions of the Association.

Affiliation with the world's largest mineralogical society cannot fail to increase membership, enlarge circles of acquaintanceship, and stimulate a keener interest in mineralogy.

A list of affiliated clubs will be found among the back pages of the magazine.

Rocks and Minerals

PUBLISHED MONTHLY

Edited and Published by PETER ZODAC

June 1941

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The Official Journal of the Rocks and Minerals Association

Chips From The Quarry

APPROVAL SHIPMENTS

An interesting phase in buying mineral specimens by mail is the approval shipment which is a regular feature with most established dealers. In order that it will function satisfactorily, the dealer and the collector should both be fair and honorable in their methods. The dealer should try to follow the collector's instructions when sending the material ordered as to size, quality, and price of specimens wanted and each specimen should be accompanied by a label giving its name and locality.

Recently we have received a number of complaints from dealers stating that some collectors have been unfair in their methods of handling approval shipments. According to these complaints the collectors have held shipments for many weeks without acknowledging their receipt nor even the letters which followed in due course; when shipments were returned most of the minerals were very carelessly wrapped so that some of them reached the dealers in a damaged condition; collectors often retained but a small fraction of the specimens sent them; and quite often the collectors refused to pay the return postage by deducting the amount so expended from the checks sent the dealers.

What is the collector's obligation in regard to an approval shipment which he requested?

1. He knows that minerals as a whole are heavy so that postage is a most important item. Furthermore, many minerals are so delicate or fragile that they break easily—hence these must be wrapped and packed with great care. The mailing of specimens is a most serious problem to a dealer and he must give it his utmost attention. Therefore, when a collector plans to purchase only $1 or $2 worth of specimens he should not request a $30 or $40 shipment.

2. Try to acknowledge receipt of the shipment within a few days, if only by a card. The dealer is entitled to this act of courtesy on your part since you requested the shipment.

3. On returning specimens, wrap them up carefully and pack well so that they will reach the dealer in good condition. Follow his methods in packing.

4. Pay your end of the postage even if the dealer does not actually request it. Do not let the dealer outdo you in generosity.

Peter Zodac

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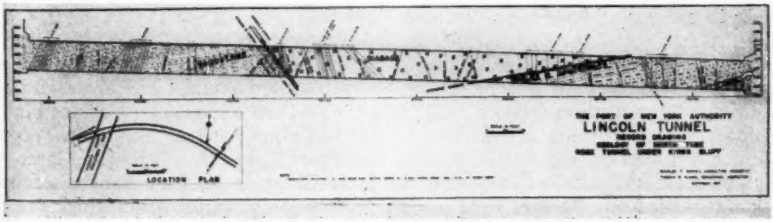
THE GEOLOGY OF THE LINCOLN TUNNEL
PART 3

By THOMAS W. FLUHR

The Rock Tunnels Under Kings Bluff.
South Tube.

A construction shaft was sunk at the west side of Hudson County Boulevard East. The tunnel section connecting this with the Weehawken Plaza was constructed in open cut. From the construction shaft a rock tunnel was driven eastward on a curve to the ventilation shaft on the east side of Kings Bluff. The shales and sandstones at the site of the construction shaft, lying in the fault graben west of Kings Bluff, are jointed, and close to the shaft were weakened by the effects of surficial weathering. This was especially effective close to the construction shaft where the rock cover above the tunnel was thin. In order to secure a safe portal the contractor adopted the expedient of driving two side drifts for a short distance and later excavating to full tunnel size. Roof support was used for a distance of approximately 100 feet from the construction shaft. Beyond that point while jointing was still a prominent feature of the rock it proved to be more stable and no support was needed. The most prominent system of joints had a strike of due N-S and a dip of 70°W with the joints spaced 0.5' to 2'. Less prominent joint systems were present also, one with a strike of N12°E and a dip of 80°NW and another with a strike of N80°W, dip vertical to 80°SW. These interecting joint systems made the rock blocky near the construction shaft. Shales and sandstones dipping gently to the west and for the most part of good quality were found in the tunnel as far as Station 165+60. At that point the rock became jointed and drag folding appeared. The sediments, showing heretofore a gentle dip to the west or almost horizontal bedding, were bent downward to the east, indicating that the tunnel was approaching the major fault where it would enter the diabase of Kings Bluff. Between Stations 165+74 and 165+96 the rock was badly crushed and decayed. This was the location of the main fault, movement producing a crush zone about 25 feet wide in which most of the rock is literally mashed to small bits. Black chloritic and serpentinous alteration products were found in the interstices of the crushed rock. No water was present fortunately, and four steel bents were sufficient to support the roof of the tunnel. From Station 165+96 to Station 166+14 shearing and jointing were prominent in the diabase but decay was absent. Passing eastward the tunnel penetrated diabase for



Rock Tunnel under Kings Bluff

some distance but at Station 167+64 shales and sandstones were found in the invert of the tunnel and at Station 169+15 the tunnel had passed entirely into the sediments. The intrusive contact was well displayed in the tunnel, where the line of contact, coming in at the floor of the tunnel gradually rose on a 15 degree grade in a straight line until it passed out at the roof. The contact was tight and gave no trouble. The shales and sandstones then continued in good condition until the New Jersey Ventilation Shaft was approached.

The North Tube

This was constructed similarly to the corresponding south tube section. The geologic features were practically the same. The major fault zone was encountered in the vicinity of Station 165+50. Fracturing, shearing and drag folding were present but the quality of material in the crush zone was much better than in the corresponding part of the south tube and the excavation was carried through this zone without roof support.

Close to the New Jersey Ventilation Shaft a small sill of diabase about 5 feet thick was found within the shale-sandstone series. This continued into the Ventilation Shaft. In the tunnel this diabase stringer followed the bedding of the sediments but in the shaft broke across the bedding for a short distance.

The New Jersey Ventilation Shaft and Adjacent Tunnel Sections.

Since the south tube was completed before the north tube was begun, this section of the work was split into two operations. The south half of the ventilation shaft was excavated, the south tube driven across the river, and the New Jersey ventilation building erected; later the north half of the shaft was excavated and the north tube driven. The operations and geologic conditions encountered were similar in the case of both tubes, the only difference being that in the case of the south tube an additional working shaft was excavated to permit construction to go on at the ventilation building while the south tube was being constructed.

Before construction was started a carefully planned program of exploratory work was carried on. Borings were made and the results plotted on maps and sections.

Kings Bluff rises abruptly on the west bank of the Hudson River and but little space is available for construction work. The railroad yards near the river's edge approach closely to the base of Kings Bluff. In order to secure a foundation on rock for the heavy ventilation building it was imperative to place it to the west of the railroad for to the east of the railroad the rock floor lies too deep beneath the surface. Space being limited it became necessary to make a rock cut into the east side of Kings Bluff to provide adequate space for the building. When this rock cut had been made a steeply sloping rock wall was left behind the building site. The apparently blocky character of the rock caused much concern lest rock falls take place or loose pieces come down on the heads of those working in the shaft below. Finally the rock wall was coated with Gunite, a protective coating of cement mortar applied to the surface of the rock with a spray gun operated by compressed air. Observations over a long period of time show that the rock is maintaining its position satisfactorily.

At the site of the New Jersey ventilation shaft, shales and sandstones are present. Most of the shales are of the baked shale or hornfels type due to the proximity of the diabase sill. At this place the base of the sill is on the side of Kings Bluff and was well-exposed in the rock cut. The shales and sandstones dip regularly 15 degrees to the west. In the shaft alternating layers of shales and sandstones were found, cut by a stringer of diabase 4' to 7' in thickness. This stringer is black in color, fine-grained and very hard. At first glance it appeared to be parallel to the bedding of the sediments but actually is intruded at a slight angle to the bedding and in part cuts clearly and abruptly across the bedding. The contacts of the trap stringer with the sedimentary beds are sound. The shales for the most part are fine-grained black or bluish-black, baked hard by the action of the adjacent intrusive. Rarely a layer of brownish shale or a sandy bed is found. The bedding varies from thick, rather

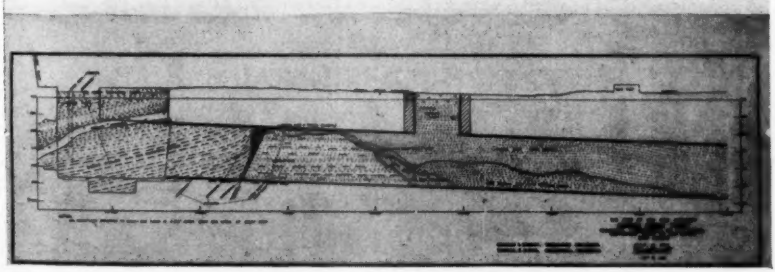
uniform massive layers, to very thin-bedded strata. The sandstone beds are mostly white or gray, fine-grained in texture and arkosic in composition.

The tunnel section to be described here extends from the New Jersey ventilation shaft at the base of Kings Bluff eastward to a point out under the river where the tunnel is entirely in the river silts of recent origin. The geology of the south tube only will be described, that of the north tube being practically identical.

From the bottom of the construction shaft a bottom tunnel drift was excavated eastward by ordinary rock tunnel methods. When pilot holes drilled in advance of the rock excavation indicated that the drift would soon pass from the rock into the unconsolidated sediments lying in the river gorge, excavation of the bottom drift was stopped. A shield was erected in the bottom of the shaft and advanced. When it had advanced east of the shaft a concrete bulkhead carrying air locks was erected and as the shield approached the limits of the bedrock compressed air was used to aid in penetrating the unconsolidated overburden lying above the rock floor.

The rock to the east of the shaft for some distance is baked shale with occasional sandstone layers. At Station 171+74 the bottom drift encountered a well-marked displacement or fault. The strike of this fault is approximately N35°E and the dip 65°NW. Slickensides on the fault faces indicate that the movement had carried the block on the west side of the fault downward in respect to the east side with practically no horizontal component of movement. The fault is accompanied by numerous joints in both the shale and sandstone members adjacent, and these weaknesses carried a little water which dripped down into the tunnel excavation. The actual crush zone of this fault is only 0.5' wide at the invert. The movement was sufficient to bring up sandstones from a horizon much below that of the baked shales and in the movement the edges of the shale members were dragged upward, so that close to the fault they show a maximum dip of 55 degrees instead of the usual 15. Despite the fact that displacement is so evident it is not possible to say how much movement has taken place for there are no key beds to serve as horizon markers. This fault, when considered in relation to the fault on the west side of Kings Bluff, suggests that Kings Bluff is a keystone block rather than merely a down-dropped mass. The stratification of the sandstones east of this fault is irregular, but in general the beds lie almost horizontal. The sandstones near the fault show prominent jointing in a N35°E, 70°NW direction, but they are not badly affected by decay or other softening processes.

The bottom drift was carried only a short distance beyond this fault zone when the rock floor dropped down so low that it was necessary to set up the shield and make use of compressed air. Immediately on passing the fault zone the top of the shield encountered the overburden. This proved to be a glacial deposit made up of coarse brown sand and rounded pebbles of shale and sandstone with occasional boulders. At Station 172+00 river silt was found lying on top of the glacial deposits. The river silt where it rests on top of the glacial material is intermixed with coarse gravel and boulders but the change from the glacial deposits to the recent deposits is abrupt,



Geologic Section at West Side of Hudson River.

indicating a time break and unconformity with change in physical conditions. The surface of the glacial drift beneath the silt mantle making up the bulk of the river fill is nearly flat with minor irregularities.

As the tunnel passed from the bedrock into the overlying unconsolidated material, flat-lying joints and bedding planes in the sandstone were found to be more and more prominent and the rock softer and more broken, due probably to ancient weathering when these ledges, now covered, were exposed to the elements.

At Station 172+10 this glacial deposit disappeared and the river silts came down into contact with the rock floor. This bottom portion of the river silt proved to be more sandy and gritty than the normal type, and carried boulders lying immediately on the bedrock.

At Station 172+31 a fine dark gray clayey silt was encountered at the top of the shield which carried scattered small shells. Below this layer and sharply marked off from it, the silt was a trifle more sandy than that at the top and very fossiliferous, carrying numerous large oyster and clam shells as well as a few boulders.

At Station 172+50 fine clayey silt was present in the upper part of the face, very fossiliferous silt below it, and between this and the rock floor was a glacial deposit consisting of a moderately coarse brown sand with a little clay, rounded gravel and large boulders, the whole showing no assorting effects. Although a large amount of coarse material was included in this deposit with no noticeable stratification it was considered to be modified drift laid down by water.

At Station 172+55 the situation was the same except that here the fine clayey silt was separated from the coarse very fossiliferous silt by a light brown sandy layer.

At Station 172+60 and eastward the river silt was separated from the glacial sand, clay, gravel and boulder deposit by a bed of reddish glacial clay carrying fine irregular sand lenses. This material was somewhat similar in appearance to varve clay except that the alternations of material were not regular but lens-like in form and the coarser portions were sand rather than silt. At Station 174+40 the shield left the glacial material behind and thereafter was entirely in river silt for the remainder of the distance across the river.

In passing through the glacial material it was necessary to excavate the material in advance of the shield and to maintain an air pressure somewhere near the theoretical. When the shield had entered entirely into the river silt the face of the shield was bulkheaded off except for two hydraulically-operated doors. The shield was then shoved blind with the air pressure reduced so that only part of the silt was permitted to enter the shield; the remainder being displaced and pushed aside. From a vantage point on the top of Kings Bluff one could look down upon the edge of the river at low tide and see a ridge of mud pushed up by the shield as it progressed, marking the course of the tunnel.

In advancing the south tube, after part of the tunnel had been lined, a working shaft was sunk east of the railroad by driving sheet steel piling down through the fill and river silt to the tunnel lining. A bulkhead and air locks were set up east of this working shaft thus facilitating construction of the ventilation building at the site of the original rock shaft at the base of Kings Bluff.

(*To be continued*)

CHISELERS TO HOLD MINERAL EXHIBIT

One June 7th and 8th, the Chiselers of Crestwood, N. Y., will hold a mineral exhibit at the home of their sponsor, Miss Evelyn Waite, 242 Scarsdale Rd., Crestwood, Tuckahoe, N. Y. A large number of minerals—including many fluorescent specimens and lamps—will be on display.

The Chiselers is a mineral club made up of young girls all of whom are active collectors with fine collections.

The exhibit is open to the public and we hope many of our readers, especially those residing around New York City, will pay it a visit. The girls will be glad to see you!

MINERAL CLUB THAT GREW FROM CACTUS

By CLARK HARRISON

The Southwest Cactus Growers have become quite prominent out on Los Angeles' southwest side where they put on a de luxe cactus exhibit each year and promote the research and study of the noble desert denizen, the hardy cactus. Their headquarters is the Manchester Playgrounds Building, near Manchester and Hoover Street, Los Angeles, California. A corner of the playgrounds is devoted to a cactus garden where different species are grown.

Late in the year of 1935, some of the members of the Cactus Growers, having become interested in mineralogy, decided to organize a mineral society as a side hobby. Donald Skinner and his wife, Mary (well known for her written articles in various magazines), were largely instrumental in organizing the new society and getting it on its feet. Skinner secured permission from the city playground department to allow the cactus garden on the playgrounds; now he suggested that the playground building be used for headquarters of the mineral club. One of the members of the cactus growers, John Akers, assumed leadership, acting as its president, until sometime later, the first elected president, Harold Eales, took up the baton.

This society calls itself the Southwest Mineralogists, and is affiliated with the

Clark Harrison, West Coast correspondent for Rocks and Minerals.

Rocks and Minerals Association. They have not gone in for a large membership, taking the California societies' idea that a small club has certain advantages: easier to get together, greater interest possible, etc. The society has gradually grown to 60 members, and the following officers are for 1941: Harold Eales, President; C. R. Stanrige, Vice-President; Pearle Arnold, Secretary. Since they are a "twin society," being devoted to both the earth sciences and the lapidary arts, they have adopted a clever insignia—the Carlsbad twins of crystallography. (Really, they are a triple society—with the cactus growers—and as soon as they find

Manchester Playgrounds Building—scene of Southwest Mineralogists' show.

another hobby to tie in with their activities, they can choose, as their emblem, the four directions of the staurolite). Many of their members attend evening classes at Manual Arts High School, westside Los Angeles, where the well known mining engineer, Victor Arcinega, instructs in mineralogy and petrology. Real community spirit runs highly. All have nice collections of specimens, gathered from local trips, or through swapping. Many of the members are expert lapidists.

The Southwest Mineralogists hold four meetings each month—one social, two educational and one speaker. At the February meeting, Raymond B. Yale lectured on Beach Stones; at the March meeting, Dorothy Akers discussed Benitoite. Wendell Stewart talked about Collecting Minerals in Mexico in the first part of February, which was a delayed January meeting. Each month a field trip is taken. The last field trip (March) was taken to the scene of the old Sterling Borax Works (now inactive), in Tick Canyon, near Lang, California, in search of borate minerals. Good specimens of howlite and ulexite were found there. In the afternoon, the party went over to the agate nodule beds near Acton.

The three Eales—a Mineralogical family. Mrs. Eales—Harold Eales and Miss Virginia Eales

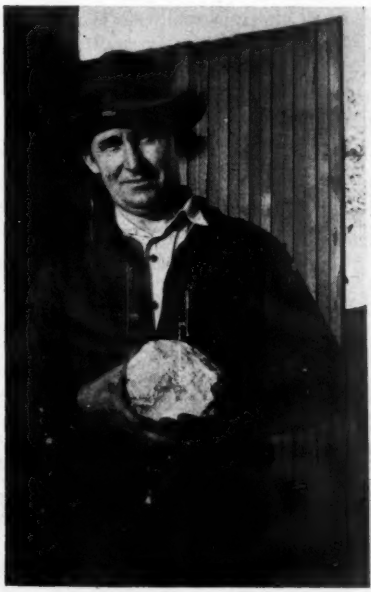
Recently, I visited one of the members, Charles Herman. He is an electrician, and originally came from New York. He is a cactus grower member. His backyard is full of cactus; and his garage is full of minerals. It is hard to tell where one leaves off and the other begins. He has some exquisite specimens of gems and minerals, both rough and polished: borates, woods (petrified, fossillized, etc.), geodes, kunzite, lepidolite, tourmalines (pink, black and green), quartz crystals of various sizes, etc. One thing that interested me was the fine group of large xenotime crystals which came from Nuevo, near Riverside.

The President, Harold E. Eales, is interested in all phases of mineralogy. In occupational life he is an electrical engineer for the Bureau of Power and Light of Los Angeles. He hails from Denver, Colorado. Mrs. Eales, besides having a deep interest in minerals and gems, often prepares the dinner at the social meetings —and she is an excellent cook. Their daughter, Miss Virginia, is interested in collecting specimens and desires to swap specimens with junior mineralogists in other states. She is especially interested in gem stones of which she has quite a collection.

On April 19-20, 1941, the Southwest Mineralogists held their Fifth Annual Mineral Exhibit at the playgrounds auditorium. It was a wonderful mineral show, attended by 3000. Ribbons were given to first, second and third prize winners, and special award winners. The judges were well known Southern California mineralogists. Earl Calvert (San Gabriel), Ernest Chapman (South Pasadena), Victor Arcinega (Los Angeles) and Dr. Marsden Heard (Hollywood). Following are the prize winners in the various groups:

(1) Best Collection of Rocks:
  (1) H. E. Eales
  (2) Fred Mason

(2) Cabochons:
  (1) Jane Hager
  (2) Albert Hake
  (3) Dr. M.c Kibben
(3) Novel Shapes:
  (1) Thelma Maynard
(4) Best Exhibit of Gem Stones:
  (1) Dr. McKibben
  (2) Florence Hake
  (3) R. L. Cass
(5) Educational Exhibits:
  (1) H. E. Eales
  (2) Dorothy Akers
  (3) Fred Mason
(6) Flat Sections:
  (1) Al Hake
  (2) R. L. Cass
  (3) Mrs. Belle Rugg
(7) Petrified Wood:
  (1) Al Hake
  (2) Jean Lippett
  (3) R. L. Cass
(8) Best Uncut Gem Material:
  (1) Gil Arnold
  (2) Mr. and Mrs. Lippett
(9) Cut Onyx:
  (1) Mrs. Barnes
(10) Non-competitive Material microscopic and miniature exhibit):
  (1) Virginia Eales
(11) Best General Collection of Minerals:
  (1) H. E. Eales
  (2) Bill Hawley
  (3) Gil Arnold
(12) Best Collection of One Kind of Mineral:
  (1) John Akers
  (2) F. C. Parris
  (3) Ellsworth Beach
(13) Best Collection of One Kind of Crystal:
  (1) F. C. Parris
  (2) Belle Rugg
(14) Best General Collection of Crystals:
  (1) F. C. Parris
  (2) Ellsworth Beach
(15) Most Attractive Exhibit:
  (1) H. E. Eales
  (2) Virginia Eales
  (3) Albert Hake



Chas. Herman holds a fine specimen of pink tourmaline from Pala, Calif.

F. C. Parris with his great collection of 2500 staurolites.

Special Award ribbons went to Mrs. Florence Hake, T. R. Stanrige, Florence Vercellone, Frank Stillwell, Arlie B. Conger, Ruth Stillwell, Sylvan Smalley, and Charles Herman.

In charge of Homer Rush, the Cactus Growers exhibited a table of various kinds of cactus, while thirty-four excellant photographs of cactus were arranged around the walls of the building. Both drew special award ribbons. Photography by George Olin and Roy Miller.

Commercial dealers exhibiting and demonstrating were Warner and Greiger of Pasadena; Pacific Abrasive Company of Los Angeles; Ultra-violet Products Company of Hollywood; and Keese Engineering Company of Los Angeles.

An exceptional fluorescent show was given by Bill Hawley and Harold Eales. Large specimens of fluorescent and phosphorescent minerals were on display and demonstrated, among which may be mentioned: Benitoite, scheelite, calcite, hyalite opal, semi-opal, travertine, English fluorite, hydrozincite, halite, wernerite, willemite, natron (it does!), phosphorescent volcanic tuff, paints used in painted pictures, dime store dishes, rugs, plastics, cloth (especially that used in dancers' costumes), calcium sulphate in glass jar, etc.

One unusual exhibit was that of F. C. Parris of Inglewood (see photo). Parris had 2500 staurolites, gathered in Georgia, mounted on sections of cardboard. Among other interesting specimens he had a row of garnets, graduating in size from a half inch to six inches thick. Belle Rugg had a novel arrangement of hundreds of cut and polished agate nodules. She has set a goal of 1000 of these nodules halves, to be arranged in a geometrical pattern on a large table. Charlie Herman included his excellent xenotime crystals in his exhibit. Ellsworth Beach exhibited his famous large specimens of botryoidal hematite from Cumberland, England.

An excellant dinner, in charge of Mrs. Eales, was served to club members the evening of the 19th. This was social meeting night when members get together and discuss minerals, trips, etc.

This was an unusually interesting mineral show, and it was a treat to see some of the unusual specimens on exhibit. Another thing very noticeable was the community spirit and friendly atmosphere. Which all goes to show that a small club can really do big things. The Southwest Mineralogists are accomplishing the ultimate in disseminating mineralogical knowledge. Our hats are off to them!

IOLITE LOCALITY OBLITERATED

Wilbur J. Elwell, of Danbury, Conn., sends us the bad news that a noted iolite locality has been blasted into oblivion. The occurrence was in a road cut near the former site of Bigelow Pond, in Union, Tolland County, Conn. (See *Three Connecticut Localities,* by Wilbur J. Elwell, ROCKS AND MINERALS, Sept. 1940, p. 298).

The road was recently widened and graded and in the process the iolite-bearing rock was entirely removed.

PHILADELPHIA MINERALOGICAL SOCIETY

On Thursday, June 5th, the Philadelphia Mineralogical Society will hold an important meeting that will be devoted to a program commemorating the issue of the first number of the AMERICAN MINERALOGIST, exactly 25 years ago. The meeting will be held at the Academy of Natural Sciences, in Philadelphia, Pa., at 8:00 p.m. A large number of visitors is expected to be present, one of whom will be the Editor of ROCKS AND MINERALS. We hope all members of the Association residing around Philadelphia will attend the meeting.

MINERAL RESOURCES OF NEW ENGLAND

By HAROLD LADD SMITH

Director of Research, Vermont Marble Company, Proctor, Vermont
Chairman, New England Council Committee on Mineral Resources of New England

Read before the Industrial Minerals Sessions, American Institute of Mining and Metallurgical Engineers, New York City, Feb. 19, 1941.

Probably there is no group of states where a cooperative regional effort has been more effective than in the case of the six New England states. The New England Council was established fifteen years ago as a result of a conference of the then Governors of the New England states, who realized that many of the industrial and economic problems of this area were not limited by state boundaries. The Council is nonpolitical and it is supported entirely by voluntary subscriptions from those who realize that their own well-being is linked with the prosperity of the area in which they live. The Council has been increasingly effective in focusing attention on matters of common interest and in obtaining action.

Something over a year ago the Council sponsored the organization of a New Products Committee under the chairmanship of Dr. Karl T. Compton, President of Massachusetts Institute of Technology. The membership comprises a group widely representative of New England not only geographically but industrially. At the time of its organization the broad objectives of the committee were stated to be:

1. To foster the development of new products within New England or for New England industries.
2. To determine whether there are additional resources within the area that may be profitably developed.
3. To mobilize the industrial research facilities of New England.
4. To assist the manufacturer, particularly the smaller manufacturer, in utilizing organized research.

In order to explore this broad assignment effectively a number of sub-committees were appointed. For example, in the problem of awakening the small manufacturer, particularly to the importance of industrial research, a device known as Research Day in New England has been made use of. This is primarily a promotional activity. Through a series of meetings organized in some ten industrial communities throughout New England a wide section of the public is able to listen to talks on research, through exhibits to see the practical results of industrial research, and thus to learn the dependence of their communities and industries on the constant search for new products and better processes. Other subcommittees were charged with the responsibility of analyzing sources of new products of possible interest to this area, to study the problem of financing new industrial developments and to appraise in the light of new industrial uses and modern recovery methods our mineral resources.

As chairman of this Committee on Mineral Resources, it has been my privilege during the past year, to work with a group possessing the best ability in the field of mineralogy and economic geology. The time has been too short for many outstanding accomplishments but a progress report may possibly prove interesting to a group of this nature.

Although not normally considered a major source for mineral products, the value of mineral production in the six New England states is approximately $25,000,000 annually. The lack of continuity in New England rock formation is recognized as a basic problem in the development of mineral resources.

But by a series of questionnaires the scope of the committee problem was outlined and in a subdivision of responsibility thirteen subcommittees were organiz-

ed. There follows a brief record of the activity of these committees in the past year.

Glass-Sand Investigation

We were told that possibly two glass manufacturers might be interested in locating a glass factory in New England, if it could be demonstrated that suitable raw materials were available,—limestone, feldspar and sand. We were asked to determine what resources of suitable glass-sand especially could be offered.

The investigation was under the very able direction of Professor Frederick K. Morris of Massachusetts Institute of Technology, assisted by Professor Bain of Amherst and Professors F. H. Norton and A. M. Gaudin of Technology. The laboratories of Arthur D. Little assisted in chemical analyses. The Committe report has just recently been submitted to the glass manufacturers. We are confident that we will be able to demonstrate the availability of a source of silica that will meet their most exacting requirements and hope that the economics of the situation will permit the location of a plant in New England to serve the needs of that important market.

Preliminary surveys are being made also of other large tonnage users of silica, so that volume may justify the necessary development.

Just recently it came to our attention that a New England user of glass had about decided to establish their own glass plant in West Virginia, never having seriously considered the possibility of local resources. We have persuaded them to delay their decision until they can study our evidence regarding local raw materials.

Other phases of the glass and ceramics field, especially material for glazes, have been studied by this same committee.

Clay

Prof. F. H. Norton of Massachusetts Institute of Technology is directing our study of the New England clays—notably the unique and extensive light colored clays of Vermont. Their use as paper fillers and for the manufacture of light face brick is to be studied. In that work he is being assisted by Professors Jacobs and Gaudin.

General Sand and Gravel

Closely related to this field of investigation is the study of general sand and gravel, the production of which in New England in 1937 reached a value of $3,558,000. This is being done by Prof. Joseph M. Trefethen of the University of Maine, assisted by Professors Quinn and White. They have tabulated what has been done by the various New England states, to determine the suitability of sand and gravel aggregate for concrete, especially in highway construction. New Hampshire has led in this work. The Committee has extended their study further afield and have presented a report with recommendations as to policy gleaned from the work done elsewhere—notably in Wisconsin.

This same group has striven to find a local source of suitable quartz grinding pebbles to supplant the Belgian imported product. New England gravel as a ballast shipment in coal barges, to areas less blessed with suitable aggregate, is also being studied.

Non-Metallics

The large and promising field of the general non-metallics has been studied by a group headed by Mr. Roscoe J. Whitney of Leominster, Massachusetts with the support of Professors Morris and Bain. It is in this field that the greatest possibilities lie and we are fortunate to have this work directed by a man of especial ability and enthusiasm. This committee is focusing their attention on the possibilities for the pegmatites, barite, fluorite, kyanite, sillimanite, spodumene, etc. Under this committee are also grouped the more familiar mica, asbestos, diatomaceous earth and fuller's earth.

During the summer our committee was able to persuade the Bureau of Mines to assign two of their experts to spend three weeks in New England. Dr. Alton Gabriel, Petrographer of the Eastern Experiment Station, gave his attention to the andalusite, sillimanite and kyanite deposits. At least two good prospects were found.

Dr. Frank L. Hess, Mineralogist of the same Eastern Experiment Station, specialized on the pegmatites and reported five or six definitely promising locations, not

only as sources of feldspar and mica but beryl, lithium, caesium and other rare elements.

Mr. Whitney, the subcommittee chairman, acted as guide and observer, during the entire stay of these experts. In addition several other members of the committee cooperated in their respective territories. We also secured the assistance of Prof. Bannerman of the New Hampshire Development Commission and Mr. Gregg of the Connecticut Development Commission.

The report of this investigation by the Bureau of Mines will be available shortly and serve as a basis for further focused investigations.

Metallics

To Prof. Alonzo W. Quinn of Brown University, we have assigned the discouraging and unpromising field of the metal resources. He is being assisted by Prof. White and Mr. Whitney. They are attempting to list all past operations in metals in New England—such as iron, lead, zinc, copper, etc. Most of these are in the sub-marginal field of doubtful economic value but accurate records seem desirable.

Abrasives

The abrasives of New England are having the attention of Prof. Edward L. Troxell of Trinity College, who is Connecticut State Geologist. This study covers emery, garnet and abrasive quartz.

Peat

Although peat resources more properly come under an agricultural heading, Prof. George White of the University of New Hampshire has studied the possibilities in the light of reduced foreign imports, and reports increasing production in Maine, New Hampshire, Massachusetts and Connecticut.

Marble, Granite and Slate

Prof. Elbridge C. Jacobs, of the University of Vermont and State Geologist for Vermont, is quite the logical one to direct the Committee on Marble, Granite and Slate. He is assisted by Professors Quinn and Trefethen and myself. The past studies into the by-product uses of granite and slate and waste are being reviewed.

A new plant is under construction in Vermont that will produce a white inert pigment, 99½% finer than ten microns, with an average particle size of about 2-½ microns. This and other grades will find extensive use in paper coating, for rubber, linoleum, paint, in wire insulation and for the manufacture of phonograph records. It promises to be a major development in Vermont's marble industry.

Mineral or Rock Wool

Mineral or rock wool manufacture is having the attention of a committee directed by Prof. George W. Bain of Amherst, with Prof. Troxell and myself. Previous studies in this field have been reviewed and economic problems of competition and fuel costs have been considered.

Correlation of Existing Information

The necessity of the correlation of existing information on the subject of New England's mineral resources presents a rather staggering assignment. This is, however, a basic requirement for a thoroughgoing study. Prof. George White of the University of New Hampshire assisted by Prof. Morris and Mr. Whitney, are giving this consideration. Prof. Palache of Harvard is mapping Massachusetts minerals and compiling a bibliography, and in this work we are cooperating. Mapping of mineral resources and compilation of a bibliography seem essential, but so far little has been accomplished. It seems doubtful if much can be done without funds to engage assistance.

Geological Survey

New England Geological Surveys are having the attention of Prof. Walter E. Ekblaw of Clark University with Professors Jacobs and Troxell assisting. The present cooperative program between the United States Geological Survey and the Department of Public Works of Massachusetts is being extended to other states. Our commitee is active in urging the present legislatures to appropriate funds to be matched by the federal government, so that our New England geological maps may be brought up to date and the extent of resources determined.

A special study is being made of the outstanding Geological Survey of Illinois, to consider the possibility of a New

England-wide survey along similar lines. The committee is impressed by the inadequacy of existing information and the need for extensive mapping.

We are receiving the utmost cooperation from the United States Geological Survey and are assisting in strategic mineral surveys in New England, for the Council for National Defense. The expense of extensive mapping of asbestos resources, for example, was saved the federal government through committee collaboration. We believe that our group of experts, familiar with local conditions and problems, can aid the federal government materially.

The services of our committee have been offered to the Advisory Commission to the Council for National Defense and we are cooperating with the New England Museum of Natural History, which has a very complete collection of New England minerals. We are also closely in touch with the various state planning and development commissions in New England and are aiding them in problems involving mineral resources.

College Cooperation on Mineral Resource Study

It has been felt that we should encourage the study of New England mineral resources in our colleges and universities. There are undergraduate and graduate students specializing in geology, mineralogy, or related subjects, whose interests might be directed to New England resources. Prof. Donald H. McLaughlin, of Harvard University, with the help of Prof. Ekblaw and Mr. Whitney, are giving this study and acquainting the New England colleges with the subject. We are considering offering some nominal cash prizes to stimulate interest.

One present example of such college cooperation is found at Amherst where a student of Prof. Bain's is investigating the kyanite schist belt at Westfield, Massachusetts, not only as to its geological features but as to its susceptibility to concentration by flotation to obtain an acceptable refractory product with the possibility of valuable by-products.

Publicity

Publicity regarding the existence of this committee and reports on its fields of endeavor should help considerably in furthering our program. We want it generally known that there is a competent group, with no axe to grind, but ready to assist in appraising mineral deposits and to further the exploration of those that warrant it. It is equally important that we be consulted to prevent the investment of capital in unworthy mineral projects.

There are nine amateur mineral clubs in New England, which have been advised as to our committee personnel and our aims. It is hoped that they will be sympathetic and cooperating groups.

Prof. Frederick K. Morris of Massachusetts Institute of Technology, with the advice of Dean Cloke and Mr. Whitney, is preparing articles for the Rocks and Minerals Magazine, American Journal of Science and the American Mineralogist.

Miscellaneous

There are a number of other miscellaneous problems having attention.

There is a need for listing the mineral resources used by New England manufacturers and determining their sources of origin.

There should be a list of the minerals of economic value with some idea of their value and volume. Such a study must be in the light of the growing importance of the non-metallics and the modern methods of separation and purification. Many minerals heretofore looked upon merely as impurities are beginning to have value in their own right.

We have tried to assist a large mineral producer to determine possible hidder value in this grout piles. There are opportunities for extending this service, especially to the small operator.

Committee Limitations

Our committee is a volunteer organization, without funds. Members give generously of their time and money to further the work of the committee, but it immediately becomes apparent that some functioning organization, with trained personnel and resources, must bridge the gap between the studied conclusions of the committee in recommending a field as worthy of study, and the time when venture capital can be interested in industrial development of a property or an ex-

isting concern can be persuaded to take over the resources.

The responsibility of the Committee on Mineral Resources is great at this time because of the importance of undeveloped resources in national defense. While the existence of strategic minerals in New England is limited, we should nevertheless further their discovery and development to the utmost. Beside that is the long-range problem of industrial development in New England. We have gone far enough in our studies to know that there *are* definite mineral deposits that need to be explored, property options secured, recovery methods studied, markets and competitive situations analyzed.

Industrial expansion in New England is not hampered by the lack of venture capital but rather by the need for organization and technique to appraise opportunities for specific enterprises. Of fundamental importance to New England are the assets of skilled labor and a long tradition of manufacturing, a concentrated market of relatively high purchasing power, and those facilities for research and technical development which are the modern equivalent of Yankee inventive genuis.

How then can the New Products Committee implement its findings?

Sponsored by the New England Council, it is planned to organize a private corporation of an engineering and fact-finding nature. Though privately financed, it will be quasi-public in its association and objectives. It will not be for the purpose of promoting new industries through the raising of venture capital, but to appraise opportunties for specific enterprises in the New England area from a practical consideration of all the factors involved. It is not conceived as competitive with present engineering or research facilities but rather that such existing facilities, both institutional and private, will be utilized.

The proposed organization will be competent to study and appraise new industrial projects originating from:

Natural resources of all kinds.

The expansion opportunities for New England industrial concerns.

The possible extension into this area of industries now centered largely or wholly in other regions.

Situations in which producers' goods are consumed in a volume substantially in excess of the regional supply, as a logical basis for manufacturing operations.

Interest of venture-capital groups in promoting new inventions and developments.

Income will be derived from fees for engineering services rendered, from royalties and from the negotiation of proven natural resource or manufacturing opportunities. It is hoped that the corporation can ultimately be established on a self-supporting basis. The importance of long-efficient processes to offer when the inevitable let-down occurs, is stressed repeatedly by such men as Dr. Karl T Compton and Mr. W. L. Batt. It is only by such methods that the vastly expanded industrial facilities created by the demands of defense can be adapted to a normal peace-time economy. We have been encouraged to believe that this project, which at the moment exists only on paper, can contribute to this end. Though it is conceived primarily as of benefit to New England, the other 42 states are importantly concerned in the well-being of that area.

This is not the story of great accomplishment but a progress report on an effort which we hope some day will show results. Industrial development in New England is our object and we believe that industry founded on raw materials peculiar to New England is more likely to stick than a manufacturing development based purely on fabrication of imported raw materials.

Editor's Note: Readers who may wish to cooperate with the Committee are referred to Mr. Roscoe J. Whitney, 54 Church St., Leominister, Mass., or to Mr. Richard B. Cross, New England Council, Statler Bldg., Boston, Mass.

PEGMATITE MINERALS OF THE PALERMO QUARRY, NORTH GROTON, N. H.

By HAROLD J. VERROW

Gorham, New Hampshire

INTRODUCTION

About twelve miles west of Plymouth, in mid-western New Hampshire, the small town of North Groton is situated. Two miles southwest of North Gorton, a pegmatite was mined for mica in the early 1900's and was abandoned in 1905. This quarry, named the Palermo, is very interesting for the abundance of many unusual minerals, in particular phosphates, such as graftonite, lazulite, triphylite and its alterations, and at least one new mineral, whitlockite, which the author of this article discovered in 1939. Indications point to several other new minerals occurring here. These complex constitutents make up a large part of the pegmatite that ocupies the top part of the quarry. This particular part of the pegmatite did not have an abundance of mica and therefore was not mined.

THE PEGMATITE

This body of pegmatite is one of the many that occupy the central and southern portions of New Hampshire. It probably is post-carboniferous in age, which is probably a part of a group of granites and granite-gneiss which is equivalent to the Biddeford granite of southeastern Maine. This mass of pegmatite is roughly circular in shape, is situated on the side of a steep alope and is nearly 150 feet in diameter. There are several huge cuts in the pegmatite which were made by following the mica, the largest of these is nearly 100 feet long, 30 feet wide and 30 feet high. There is one large open cut on the top of the pegmatite which ends close to where the unusual phosphates are found. These huge cuts or pits had much waste matter, so therefore a huge dump was formed, being nearly two acres in size. Coarse microcline crystals with large masses of anhedral quartz and large masses of albite (cleavelandite) constitutes most of the body of the pegmatite. The minerals introduced into the pegmatite during the pneumatolytic and hydrothermal stages are limited in position entirely to the southwest wall-rock contact, indicating that there was a through-going channel along the contact to which the mineralizing vapors and solutions had access. The pneumatolytic and hydrothermal mass is situated on the top of the pegmatite and was exposed by erosion.

PARAGENESIS

There are three distinct stages of mineralization at the Palermo. The first, or primary stage, represents the cystallization of the magma not different in composition from a normal granitic magma. Microcline, muscovite, tourmaline and quartz crystallied at this time.

The second stage of mineralization has been termed pneumatolytic, since it apparently represents a high temperature stage of mineralization by magmatic emanations rich in volatile constituents. Large quantities of beryl, triphylite, graftonite, apatite and albite were introduced at this time.

The third, or hydrothermal, stage of mineralization resulted in the progressive introduction of a large number of minerals by hydrothemal solutions. The most abundant of these are quartz and muscovite. The hydrothermal stage is considered to have been an essentially continuous period of replacement, during which the temperature of the solutions gradually fell. The final action of the solutions, as their tempearture approached that of meteoric waters near the surface, was an alteration of previously formed minerals. The most abundant altered mineral is triphylite, which changed to several hydrous iron and manganese phosphates.

MINERALS

Magmatic	Microcline
	Muscovite
	Tourmaline
	Quartz
Pneumatolytic	Beryl
	Triphylite
	Graftonite
	Whitlockite
	Apatite
	Lazulite
	Albite
Hydrothermal	Rhodochrosite
	Siderite
	Gummite
	Uranophane
	Autunite
	Pyrite
	Garnet
	Cyrtolite
	Lollingite
	Vivianite
	Ferri-sicklerite
	Heterosite
	Dufrenite
	Fairfieldite
	Psilomelane
	Manganite
	Limonite
	Melanterite

DESCRIPTION OF THE MINERALS

MICROCLINE. Microcline-perthite is very abundant in the pegmatite, making up a large percentage of it. It occurs in rough subhedral crystals up to a foot across. On the border of the pegmatite it is intergrown with quartz as graphic granite.

MUSCOVITE. Muscovite of two generations is clearly represented. The primary muscovite was one of the earliest minerals to form. It occurs in subhedral crystals up to a foot across and several inches thick. Huge masses of hydrothermal muscovite occurs replacing quartz and microcline and is generally light green in color.

TOURMALINE. All the tourmaline seen was the black iron-rich variety, which occurs as rough prismatic crystals and large subhedral masses, up to eight inches across. The masses of tourmaline are in a state of alteration, a chlorite being the product. This chlorite occurs as thin films and small masses throughout the masses of tourmaline. The black tourmaline is distributed lightly through the entire mass of pegmatite.

QUARTZ. Quartz occurs as large anhedral masses interstitial to the microcline and as crystals up to five inches in diameter. Much of the quartz is milk white and opaque, while much of it also is light milk white and translucent and often contains spangles of mica. Many of the crystals are doubly terminated and colorless or light smoky. One crystal collected has a moveable bubble near its center and by tipping the crystal the bubble can be made to move about one-half inch.

BERYL. White, pale green and yellow beryl occurs in considerable abundance. Many crystals observed had a diameter of ten inches and were perhaps two feet long. Many crystals had small dark inclusions of an unknown nature and much of the beryl had clear gem portions, especially the yellow variety. A number of beautiful gems have been cut from this material. A few crystals with steep terminations have been collected.

TRIPHYLITE. Several very large masses of triphylite have developed at the Palermo. The largest mass exposed is about ten feet long, with an average width of about two feet and about a foot in thickness. Another, now partly exposed, may be much larger than the above mass. The triphylite is gray in color and shows large cleavage surfaces. No crystals as yet have been found. The triphylite exhibits one perfect cleavage and a less perfect cleavage at right angles to the first. The fracture is conchoidal. Practically all the triphylite is badly altered to other minerals.

GRAFTONITE. The rare mineral, graftonite, occurs as large masses intergrown with triphylite. This graftonite is monoclinic, has a basal cleavage, hardness 5, specific gravity 3.7, and when fresh has a salmon-pink color, but is usually dark from alteration. It occurs in-

terlaminated with triphylite, probably as a simultaneous crystallization. Several hundred pounds of graftonite have been found by collectors. Much of the triphylite that occurs interlaminated with the graftonite has altered to the purple mineral, heterosite, making attractive specimens.

WHITLOCKITE. On a collecting trip to the Palermo in November, 1939, the writer observed and collected a rhombohedral mineral that could not be identified in the field. After analyzing, checking and rechecking this mineral for several months, the writer sent it to Harvard University, Cambridge, Mass., for identification. Dr. Palache thought it new and requested more specimens so that they could make a complete analysis and study of it. Last October (1940) this mineral was announced to be new and has been named whitlockite after Herbert P. Whitlock, a former President and Secretary of The Mineralogical Society of America, a former state mineralogist of New York and at present Curator of Minerals and Gems at the American Museum of Natural History. This new mineral, whitlockite has the following properties which were calculated by Dr. Frondel.[1] Crystallization rhombohedral scalenohedral. Uniaxial negative, with $w=1.629\pm0.002$, and $\epsilon=1.626\pm0.002$ (for Na light).

Specific gravity as calculated 3.19 and as observed 3.12 ± 0.02 No. cleavage. Fracture sub-conchoidal to uneven. Brittle. Hardness 5. Luster vitreous, inclining to sub-resinous on fracture surfaces. Colorless and transparent.

Composition essentially tri-calcium biphosphate $Ca_3(PO_4)_2$, with Ca substituted for by Mg and Fe to about Mg. Ca=1 : 13, and Fe : Ca=1 : 18. Contains a trace of Cl and F.

Whitlockite ocurs as white rhombohedral crystals, sometimes stained with iron or manganese oxides, up to 1½" long and is associated with lazulite and other phosphates. All the specimens found occurred in one of the dumps which came from the large phosphate bed on top.

APATITE. Several varieties of apatite occur associated with albite, in quartz with tourmaline and with whitlockite. Perfect small green hexagonal crystals occur in vugs in cleavelandite. Massive dark green occurs with quartz and tourmaline. Small secondary crystals with golden metallic faces occur in small vugs in whitlockite. Pure white, massive and crystallized apatite occurs on white quartz, and was indentified by optical and X-ray study at Harvard University.

LAZULITE. Lazulite occurs in masses up to four inches in diameter in quartz, microcline and muscovite. When occurring in mica, the mica generally surrounds the lazulite. The Palermo lazulite is azure-blue in color, has no cleavage and has an uneven fracture. Lazulite is a rare mineral in the New England pegmaties.

ALBITE. The platy form of albite commonly known as cleavelandite is very abundant in the pegmatite, having replaced large quantities of microcline. Fine crystals of albite occur in the crevices of the cleavelandite.

RHODOCHROSITE. .. Perfect small crystals of rhodochrosite occur protruding in cavities associated with whitlockite, siderite and altered triphylite.

SIDERITE. Small light brown masses of siderite occur with whitlockite and other phosphates and is an alteration of these phosphates.

GUMMITE. Small orange-yellow masses, up to ½", of gummite, an alteration of uraninite, occur in secondary muscovite where it has apprently replaced muscovite. It is strongly radioactive.

URANOPHANE. Uranophane occurs as a yellow coating on muscovite and microcline and is an alteration of uraninite.

AUTUNITE. Small perfect, thin tabular crystals of autunite occur in cavities that was formerly occupied by uraninite and also in muscovite. One specimen collected has a cavity 4x1x1" and contains hundreds of autunite crystals. They fluoresce a strong yellow-green under the argon lamp.

PYRITE. Small masses of pyrite occur associated with many of the phosphates and also with siderite.

GARNET. Garnets are found as small crystals associated with graftonite and mica. They are red in color and well crystallized. The crystals are modified dode-

1 Whitlockite: A New Calcium Phosphate $Ca_3(PO_4)_2$, by Clifford Frondel. *American Mineralogist*, March, 1941, pp. 145-152.

cahedra and often somewhat distorted, and some of the smaller ones are transparent.

CYRTOLITE. Cyrtolite is characterized and named because of the curved form of its crystals which are tetragonal pyramids. It is an alteration of zircon and occurs as brownish-red or chocolate colored crystals and its generally found associated with or near secondary uranium minerals. The largest crystal found measures nearly an inch in diameter. The rare element hafnium occurs in cyrtolite to about 4%. Cyrtolite is generally radioactive due to minute inclusions of secondary uranium minerals.

LOLLINGITE. Small irregular crystalline masses, ¼" in size of lollingite occur in triphylite. It is tin white in color.

VIVIANITE. Vivianite is a very common alteration of triphylite. It occurs at the Palermo as thin films along the cleavage planes of the triphylite. The mineral is deep blue in color, and strongly pleochroic from deep to colorless.

FERRI-SICKLERITE. Ferri - sicklerite occurs as large dark brown masses associated with triphylite. It is the first alteration after triphylite. It has a dark brown powder, a perfect prismatic cleavage and is strongly pleochroic from light to dark brown.

HETEROSITE. Heterosite, the second alteration of triphylite and the alteration of ferri-sicklerite ,occurs in large masses. It is purple-red in color and has a red powder. It is optically negative, with a moderate optic angle, has a high refractive index of about 1.84, and a high birefringence. It is strongly pleochroic from greenish-gray to deep red.

DUFRENITE. Large masses of dufrenite have been found at the contact of the triphylite and the quartz wall and is apparently an alteration of triphylite. It occurs as large masses of small botryoidal nodules of radiating fibres. It is very dark brown or reddish-brown in color and is tanslucent in thin fragments. It has a perfect cleavage with a silky luster and is strongly pleochroic from yellowish to green and dark red-brown. Many specimens collected show a zonal structure with varying optical characters.

FAIRFIELDITE. Fairfieldite occurs as straw colored masses or foliated plates or crystals associated with the other alterations of triphylite and is an alteration of triphylite. It has two good cleavages, is fusible, and has a gravity of 3.5.

PSILOMELANE. Psilomelane occurs massive and botryoidal and is associated with apatite and whitlockite. It is black in color and has a conchoidal fracture.

MANGANITE. Manganite occurs as small black crystals with a submetallic luster and is associated with heterosite, limonite and melanterite. It is found with pyrite that is cutting a large mass of altered triphylite. The pyrite is badly altered and apparently the manganite was formed from it.

LIMONITE. Limonite occurs with manganite and melanterite in altered triphylite and is found staining many other minerals.

MELANTERITE. Melanterite is associated with manganite and limonite in altered triphylite. It occurs as small green masses and is soluble in water. The water solution gives a test for ferrous iron and the sulphate radical.

Many unidentified minerals have been found at the Palermo Quarry and at least two of them may prove to be new species. One, from the writer's analysis, appears to be a silico-phosphate of aluminum, the other, thought to be fillowite, was sent to Harvard, for verification. where it was proven to be something else. We shall await with much interest what Harvard University may determine these minerals to be.

ACKNOWLEDGMENT

This article has been written at the suggestion of Dr. Clifford Frondel of Harvard University, and the writer takes this opportunity to express his gratitude to Dr. Frondel for the many courtesies and helpful suggestions extended him in the field and at home.

MICRO MINERAL MOUNTS
Photomicrographic Technique

By JAY T. FOX

Fox Museum of Natural History
Seaford, L. I. N. Y.

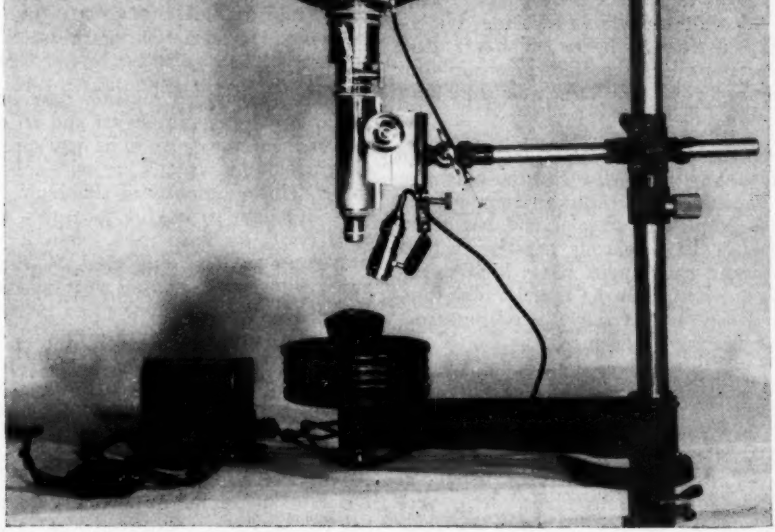
The photographing of thin transparent sections of rock and mineral specimens through a microscope with transmitted light, is comparatively simple when compared to the photographing of opaque specimens through a microscope with incident light. Different equipment and more careful procedure is required. Extremely accurate technique is absolutely necessary. After many experimentations on black and white and color film, I believe I have solved what appeared to be an unsurmountable enigma, a year ago. The special unit I assembled to accomplish my results will now be described in full detail. (See Photograph)

MICROSCOPE

For this type of work, the only part of a Leitz monocular microscope I use is, the observation tube, with its rack and pinion and ball-bearing vernier attachment. No sub-stage, base or mirror is required. This part of the microscope is equipped with a dove-tailed slide to fit a dove-tailed groove on the special microscope stand I refer to in the following paragraph. I find by equipping this observation tube with a 4x ocular lens and a 3.2x objective lens, it makes an ideal combination when used with miniature camera of my choice.

MICROSCOPE STAND

The microscope stand consists of a table clamp, into which slides a vertical pillar, 18" in height. This pillar is firmly locked into place by means of a thumb screw on the table clamp. A special right-angled fitting is provided, the vertical portion of which, moves up and down upon the vertical pillar. By tightening a



Complete Photomicrographic Unit.

winged nut, it can be set at any desired height. The horizontal portion of the aforementioned fitting, accomodates the microscope arm and allows same to be rotated or locked in any position. At the end of this arm there is a tilting joint fitted with a dove-tailed groove, to receive the dove-tailed slide fitting on the observation tube. This joint permits the microscope to be tilted in its vertical axis. Another 10" arm also moves up and down on the vertical pillar just below the arm which carries the microscope. This arm can likewise be rotated or clamped at any desired height on the vertical pillar. A 6" turn table is mounted at the extreme end of this arm. On this turn table a ball-socket mechanism is placed, holding an individual micro mineral mount while it is being photographed. By employing this device, orientation of the specimen is made possible in all planes and directions.

LIGHT SOURCE

A small Leitz adjustable 8 volt spot light is attached to the bottom of the microscope arm by means of a series of universal joints. A transformer supplies the power to light it. The universal joints permit the light to be placed in the most favorable position for correct illumination of the specimen being photgraphed. With proper focusing of the spot light, any degree of intensity can be obtained on any area of the specimen.

CAMERA

The selection of a suitable ultra-precision built camera of wide range, was the perplexing problem. Not only did I desire a camera for photomicrography, but I also wanted one that would be universal in its adaptations. For instance, I do other than mineral photomicrography: general outdoor photography in the field of Natural History, close-ups of entomological specimens and birds in their natural environment. After much deliberation with a bewildering variety of miniature cameras, I chose a 35mm Kine Exakta manufactured by Ihagee Kamerawerk of Dresden. Several reasons prompted my selection:

1—The 35mm (1" x 1½") is just the right size for micro mineral mounts.

2—This miniature camera is light enough to be attached directly to the top of the microscope without additional support.

3—Color film can be purchased in this size (35mm) at reasonable cost, for projection.

4—The exclusive feature however is, the Kine Exakta is the only 35mm single lens true reflex precision camera on the market.

When focusing a true reflex single lens camera, the reflected image appears in full color on a vertical ground glass. It is projected there from the ocular lens of the microscope by means of a hinged oblique mirror, (beam-splitter) which is interposed at an angle of ninety (90) degrees between the ocular lens and the film. The reflected image thus observed on the ground glass is identical, both in composition and focus to that which will subsequently be recorded upon the film. The film lies perfectly flat in a precision film channel located in the back of the camera. The accurate focusing of a micro mineral to be photographed is of great importance, as the circle of confusion for 35mm is reckoned as 1/750th of an inch. The use of a second magnifier on top of the ground glass is absolutely essential. With its use the circle of confusion is reduced to 1/200th of an inch. This delicate manipulation of focusing is thereby simplified to a great extent. The outstanding feature of accuracy and convenience in focusing, places the single lens reflex camera far above all others in photomicrographic work. This particular camera has an automatic precision focal-plane shutter. The range of speeds is from 12 seconds to 1/1000th of a second.

CAMERA ACCESSORIES

A micro-adapter made especially for this camera is needed for connecting the camera to the microscope. In photomicrography the camera lens serves no useful purpose, consequently it is not used, the microscope's ocular lens serves instead. One end of the adapter is attached to the front of the camera by means of a bayonet type connection, while the other end of the adapter is attached to the upper part of the observation tube by

means of a knurled screw. The adapter, being hinged, allows the camera to be swung out of the way when it becomes necessary to change the ocular lens in the microscope. A set of three extension tubes were procured, which greatly increased the scope of usefulness of the Kine Exakta. In photomicrography any or all three can be inserted between the camera and the microscope, either to increase or decrease the size of the image on the photographic film. In outdoor work, these tubes can be used seperately or attached end to end. They are inserted between the camera body and the regular camera lens for doing REAL close-up work: insects in natural lifelike size, the stigmas and anthers of flowers, etc. They actually convert the camera into a double or triple extension one. With these extension tubes in place, the camera can now be set as close as 2 or 3 inches to a specimen being photographed. Other accessories include, a F-3/5 anastigmat helical focusing lens for outdoor work, a telephoto lens for distance, photo-electric type exposure meter, color and polarizing filters, rigid tripod etc.

PHOTO TECHNIQUE

It is very essential that the microscope stand be attached to some immobile support. The least vibration or the smallest amount of motion will ruin your fondest expectations. A micro mineral mount is placed in the ball-socket mechanism. The spot-light is then adjusted to the proper degree of brilliancy and the microscope critically focused until a clear image appears on the ground glass of the camera. The next step is to place the second magnifier against the ground glass to obtain the sharpest possible definition. This is accomplished by the use of the ball-bearing vernier on the rack and pinion mechanism of the microscope. The superficies of the general run of most micro mineral mounts is usually unsymmetrical. By orienting the specimen in the ball-socket device, you are able to bring any area of the micro mount in parallel with the horizontal plane of the film in the camera. The micro mount reflection continues to be in full view on the ground glass of the camera up to the very instant of exposure.

EXPOSURE

For results on black and white film, I use 35mm Kodak Panatomic fine grain, whereas for full color transparencies for projection, I use 35mm Kodocrome #135-A, which has extremely fine grain quality. With magnification of 10x to 20x I get excellent definition on the black and white negatives and have encountered no difficulty in obtaining perfect results when these negatives are enlarged to 8" x 10" prints or larger. Of course the inherent beauty of micro minerals lies in the projection of the Kodocrome transparencies in full color. When one views the striking difference between a monchromatic and a color rendition of a micro mineral, there is no doubt as to the eye arresting beauty of a good color transparency. These true color reproductions can be projected to the extent of 6 ft. x 9 ft. with no apparent loss of their microscopic details. Naturally, the accurate exposure time is of paramount importance. This will vary with the magnification, as well as with the color of the mineral being photographed. As a general rule, with a magnification of 10x to 20x, the exposure time for black and white results is from 2 to 3 seconds; using color film, the time is slightly longer, 3 to 5 seconds.

CONCLUSION

My interests branch out into other fields of Natural History for which I find this photomicrographic unit indespensible. In my entomological research, the distinctive results, in full color, of the tropical beetles are strikingly beautiful. In Marine Biology, it is possible with this equipment. to place a gross specimen, no matter how large, under the microscope objective and photograph any particular area of same. Example: the stalked eye of a live crab, a parasite attached to the gill of a living fish etc. I use it to great advantage in Botany, photographing various minute fungi and myxomycetes. In short, this unit in its entirely, answers my every purpose.

NOTE: PHOTOMICROGRAPHY of opaque specimens as outlined here is not to be confused with PHOTOMACROGRAPHY. In the later case, no microscope is employed. (See article by Prof. B. M. Shaub in Photo Technique Magazine of May-1940).

NEW ENGLAND NOTES

Conducted by RUDOLF C. B. BARTSCH
36 Harrison St., Brookline, Mass.

Newry, Maine: Important notice regarding this grand locality. Understanding that passes would be required this year to enter this locality, I have written to the operators and have had the following reply: "It will be necessary for you to call at our office for passes to our mines. These passes must be signed and witnessed at our office. Passes are available from Monday to Friday afternoon, 8. A. M. to 5 P. M., for use during this same period." United Feldspar & Mineral Corp., West Paris, Maine.

It will be seen from the above that collecting will be banned on Saturdays and Sundays, in other words, collecting will be permitted only when the crew is present and I rather suspect no passes will be issued for holidays when crews are not working even though this is not stated above. As most collectors have been visiting this locality on the week-ends, few of us will be able to do any collecting here this season.

The above restrictions could have been avoided if some collectors had used a little common sense. Last fall I saw at the Newry workings a pile of mica which had been scattered in all directions by some careless, unthinking collector. A pile of spodumene had received the same treatment. Sledge hammers had been carried several hundred feet and left in abandoned workings. Unless this sort of inconsiderate treatment of other peoples' property stops, more places will be restricted and mineral collectors will receive little or no consideration when they appear.

Rowe, Mass. The Davis Pyrite Mine. This locality is one of the old abandoned pyrite mines. It is famous for the amount of gahnite (zinc spinel) which was found associated with the pyrite. A large amount of this mineral is still available on the dumps which are badly eroded and of course is somewhat weathered. Fresh material may be had by breaking up the larger pieces and good specimens thus secured. This locality may be reached by leaving Route 2 at Charlemont, through the town of Zoar to Rowe. Inquire at the Rowe store for directions for reaching the mine. The mine is about 3 miles from the store.

East Deerfield, Mass. The trap rock quarry at this locality is hardly worth a visit at present as very little specimen material is available even though the quarry is in active operation. It can be reached from Route 5 from Greenfield, Mass.

Portland, Conn. There are two minerals which I have not mentioned in previous reports and which may be of much interest to collectors. One is a new record for the Schoonmaker Mine. This mineral is gahnite. A large specimen of lepidolite was found by my friend, M. D. Bogart, and it contained several xls of gahnite, about 3/8" diameter. The other mineral is pickeringite, which has been listed from the adjacent Strickland Quarry. Due to an almost rainless April, the pickeringite has had ideal conditions in which to form on the side walls of the old dump way. There is plenty of it to be had but it is extremely fragile and unfortunately the "grain" of the schist runs at right angles to the face of the wall making it that much harder to secure a sizeable piece. If you plan to collect this mineral, bring a box and plenty of cotton to pack specimens in.

Alstead, N. H. Many changes have taken place at this locality and unfortunately to the disadvantage of the mineral collector. The Golding Keene Co. has removed all its equipment to a new working locality and I shall report later on this place. The new operator has erected a small 20-foot derrick to hoist up the bags of mica. They have started about

(*Continued on page* 220)

Club and Society Notes

Snake River Gem Club

This club, recently affiliated with the Rocks and Minerals Association, has the unique distinction of meeting in two states—Idaho and Oregon. Payette, Idaho, and Ontario, Oregon, are two little cities on the Snake River which divides the two states. The club meets alternately in Payette and Ontario on the 3rd Tuesday of every month. The next meeting will be held on June 17th in Pavette. The club has about 30 enthusiastic members. Officers for 1941 are: Frank Zimmerman, President; Irvin Troxwell, Vice-President; Margaret L. Hearn, Secretary-Treasurer. Julian Field and Geo. Gilham are Directors.

New Haven Mineral Club

The 3rd field trip of the club will be held on Sunday, June 15th, at East Hampton, Conn., a locality noted for yellow beryl. The group will meet in front of the Peabody Museum on Whitney Ave., New Haven, Conn., at 9:00 a.m., D. S. T. from which point it will proceed to the locality.

Plainfield Mineralogical Society

A regular meeting of the Society will be held on Tuesday, June 3rd, at 8:00 p.m., in the Plainfield Public Library, Plainfield, N. J. The program for the evening will be on radio active minerals—the main feature being a paper by the Secretary, Jos. D'Agostino. Many radio active specimens, photos, etc., will be on display.

New York Mineralogical Club

R. Emmet Doherty was the guest speaker at the regular meeting of the New York Mineralogical Club held Wednesday, April 16th, at the American Museum of Natural History in New York City. Mr. Doherty's topic was "Some facts and problems of Shafts 7 and 8 of the Delaware Aqueduct."

The lecture delivered by Mr. Doherty (illustrated by beautifully colored lantern slides) was one of the most interesting ever given before this scientific group which is the oldest mineral club in the United States and whose membership is made up of the leading mineralogists of the country.

A large array of rocks and minerals, dummy dynamite and cartridges, drill steel, and other items used in drilling tunnels, as well as a most attractive group of large photos, blueprints and maps—all of or pertaining to the work being done at Shafts 7 and 8, were artistically displayed at the meeting.

Mr. Doherty, who is President of the Rocks and Minerals Association, the world's largest mineralogical society, is geologist for the Dravo Corporation, of Pittsburgh, Penn., who are the contractors at Shafts 7 and 8, near Fishkill, N. Y.

Plainfield Mineralogical Society Field Trip

Members of this active organization made their second pilgrimage to the seldom visited but classic localities near Mt. Adam and Mt. Eve, Orange County, N. Y., on Saturday, May 10th, under the guidance of their Chief Scout, O. Ivan Lee.

At the (west) granite quarry on Mt. Adam, rude crystals and masses of black to brown allanite almost always accompanied by purple fluorite were found in the granite and especially in the rather coarse pegmatitic masses of feldspar and quartz. Minute violet-brown zircon crystals were also observed in the dark green hornblende, and titanite was frequent. After a luncheon made the more enjoyable by the magnificent view of the Wallkill Valley stretching westward towards the Kittatinny mountains and High Point, the trail was descended to the road leading south across the onion beds re-claimed from the swamps of an old lake bottom. After about fifteen minutes walk, two limestone "islands" were reached characterized by numerous cedar trees. In the limestone boulders on the one to the east, norbergite and graphite were found in abundance. At the southern end, a ledge occurs containing huge white coarse crystals of scapolite two of which were detached as souvenir door stops. Prisms of light green pyroxene were scattered all through the scapolite and brown titanite was very abundant, so that everyone was laden with specimens at the end of a day as interesting as it was rewarding in specimens of unusual species.

COLLECTOR'S KINKS

Repairing Ultra-violet Lamp Filters

It often happens that glass filters used on ultra-violet lamps crack from excessive heat, through jarring, or from other causes. If these filters are of special shape so that their replacement may be a little difficult, they can easily be repaired without any apparent ill affects to their fluorescent reactions.

To repair a cracked filter, tape it well with transparent cellophane. Run the tape not only over the crack but also around the edges of the filter so as to hold the two or more pieces firmly together.

It is also suggested that a new filter should have its edges taped well and snugly with transparent cellophane. This taping would not only act as a cushion to prevent jarring but it would also ease the tendency to crack.

(Transparent Cellophane (Scotch Tape) may be purchased in stationery stores.)

AN UNUSUAL METEOR

On January 22, 1941, about 9:30 P.M. at Fort Belvoir, Virginia, while pointing at certain stars in the south east of the heavens, I happened to be pointing directly at the spot and at the very instant that a meteor there entered the atmosphere. The calculations were that it first became visible at about 50 miles high and burned out after falling 15 or 20 miles. I submit this description to ROCKS AND MINERALS, thinking that some members can determine the mineral elements in the meteor's composition by the colors.

At first it was perfectly white and about the size of a baseball and then it took on a red, green, blue, orange combination of colors and increased to the size of a basketball.

While it remained white it fell rapidly and seemed to slow up and stop before increasing in size and taking on colors. This mass was followed then by white lacy fragments that seemed to float in the borders of the downward path of the main body. There was no evidence of any explosion nor did we hear any noise coming from it.

The last predominant colors or glow from the meteor was a red, greenish, orange, bluish, purple. We believed it fell several hundred miles east and about 35 degrees east of south.

It was indeed a spectacular sight. I shall not forget it.

—Walter S. Amos

PROSPECTIVE MEMBER OF THE ASSOCIATION

John Vlismas, faithful and loyal member of the Rocks and Minerals Association, is rejoicing over the birth of a young son whom he already plans to make a member of the Association in due time. Mr. Vlismas says that when his son is 10 years old he will have the finest mineral collection in the country. We have no doubt of it for Mr. Vlismas, a stone craftsman of New York City, uses minerals in fine ornamental work and the finest of specimens pass through his hands every year.

We congratulate Mr. and Mrs. Vlismas and wish for the young man a long, happy and successful life.

(Louis Thomas Vlismas was born on Monday, May 5, 1941—weight 9 lbs. 2 ozs.)

Clubs Affiliated With the Rocks and Minerals Association

ARIZONA

Mineralogical Society of Arizona
Geo. G. McKhann, Sec., 909 E. Willetta Street, Phoenix.
Meets at the Arizona Museum in Phoenix on the 1st and 3rd Thursday of each month.

CALIFORNIA

East Bay Mineral Society
Miss Marjory Welch, Sec., 3268 Central Avenue, Alameda.
Meets on the 1st and 3rd Thursdays of each month (except July and August), at 8:00 p.m., in the Lincoln School Auditorium, 11th and Jackson Sts., Oakland.

Northern California Mineral Society
A. L Rogers, Sec, 137½ Joost Ave, San Francisco
Meets on the 3rd Wednesday of the month at the Public Library in San Francisco.

Southwest Mineralogists
Mrs. Pearle Arnold, Cor. Sec., 2132 W. 76th St., Los Angeles.
Meets every Friday at 8:00 p.m. at Manchester Playground, 88th and Hoover Sts., Los Angeles.

COLORADO

Canon City Geology Club
F. C. Kessler, Sec., 1020 Macon Ave., Canon City.
Meets on the 1st and 2nd Saturdays of each month at 9:00 a.m. in the High School Building, Canon City.

Colorado Springs Mineralogical Society
Lynn M. Hopple, Sec.-Treas., Motor Route 2, Colorado Springs.

CONNECTICUT

Bridgeport Mineral Club
Mrs. Julia Walker, Sec., 55 Eaton Street, Bridgeport.
Meets in the Bridgeport Public Library on the 3rd Monday of the month.

Long Hill Mineral Club
Eugene F. Robinson, Sec., R. R. D. No. 4, Box 237, Bridgeport.
Meets on the 4th Tuesday of each month at 8:00 p.m., in the Hawley Memorial Library, Long Hill.

Mineralogical Club of Hartford
Mrs. L. T. Goodrich, Sec., 51 Jerome Avenue, Bloomfield.
Meets the 2nd Wednesday of each month, at 8:00 p.m., at 249 High St., Hartford.

New Haven Mineral Club
Mrs. Lillian M. Otersen, Sec., 16 Grove Place, West Haven.
Meets on the 2nd Monday of the month at the Y. W. C. A. on Howe St., New Haven.

IDAHO—OREGON

Snake River Gem Club
Margaret L. Hearn, Sec., Payette, Idaho.
Meets alternately in Payette and Ontario, Oregon, (two small cities on the Snake River) on the 3rd Tuesday of every month.

ILLINOIS

Junior Mineral League
E. Johansen, Sec., Morgan Park Junior College, 2153 W. 111th St., Chicago.

MAINE

Maine Mineralogical and Geological Society
Miss Jessie L. Beach, Sec., 6 Allen Avenue, Portland.
Meets last Friday of the month at 8 p.m., at the Northeastern Business College, 97 Danforth Street, Portland.

MARYLAND

Natural History Society of Maryland
2103 N. Bolton Street, Baltimore.
Office hours, Tuesdays and Fridays, 10:00 a.m. to 5:00 p.m.

MISSOURI

National Geologist Club
Mrs. D. P. Stockwell, Pres., Mt. Olympus, Kimmswick.

NEVADA

Reno Rocks and Minerals Study Club
Mrs. Rader L. Thompson, Sec., R. F. D. 1, Box 225-A, Reno.
Meets on the 1st Wednesday of each month, at 7:30 p.m., at the Mackay School of Mines, Reno.

Western Nevada Mineral Society
A. Cornely, Sec.-Treas., P. O. Box 21764, Reno.
Meets usually at the Lennox House, Colorado College Campus, Colorado Springs, on the 2nd Monday of each month at 7:30 p.m.

NEW JERSEY

Newark Mineralogical Society
William E. Simpson, Sec., 308 Grove Street, Montclair.
Meets on the 2nd Sunday of the month at 3 p.m. at Junior Hall, corner Orange and North 6th Streets, Newark.

Plainfield Mineralogical Society
Joseph D'Agostino, Sec.-Treas., 711 Sheridan Avenue, Plainfield.
Meets on the 1st Tuesday of the month at 8 p.m. at the Plainfield Public Library.

NEW MEXICO

New Mexico Mineral Society
R. M. Burnet, Sec.-Trea., Carlsbad.

Society of Archaelogy, History and Art
Carlsbad.

NEW YORK

Chislers, The
Miss Evelyn Waite, Sponsor, 242 Scarsdale Road, Crestwood, Tuckahoe.
Meets bi-monthly at members' homes.

Queens Mineral Society
Mrs. Edward J. Marcin, Sec., 46-30—190th Street, Flushing.
Meets on the 2nd Thursday of the month at 8 p.m. at 289 Etna Street, Brooklyn.

OKLAHOMA

Oklahoma Society of Earth Sciences
W. P. Smiley, Sec.-Treas., 229 W. Jefferson Street, Mangum.
Meets on the 2nd Tuesday of each month, at 7:30 p.m., at the Historical Museum, Mangum.

PENNSYLVANIA

Thomas Rock and Mineral Club
Mrs. W. Hersey Thomas, Pres., 145 East Gorgas Lane, Mt. Airy, Philadelphia.
Meets on the 3rd Friday of each month, at 8:00 p.m., at the home of its president, Mrs. Thomas.

VERMONT

Mineralogical Society of Springfield
Victor T. Johnson, Sec., 11 Elm Terrace, Springfield.
Meets on the 3rd Wednesday of each month at 8:00 p.m. at the homes of members.

WASHINGTON

Gem Collectors Club
Mrs. Lloyd L. Roberson, Sec., 522 North 70th Street, Seattle.
Meets on the 1st and 3rd Tuesdays of each month (except during the summer) at 8:00 p.m. at the Y. M. C. A.

Washington Agate and Mineral Society
Monroe Burnett, Sec., 802 S. Central St., Olympia.
Meets on the 1st Monday of the month, at 7:30 p.m. at the home of some member.

. . Collectors' Tales . .

By PETER ZODAC

A WILD GOOSE CHASE

Not so long ago we saw in the museum of a large New England city some very good prehnites labelled as coming from Plainfield, Conn. This locality was new to us and intrigued with the quality of the specimens seen we decided to visit it at our first opportunity. Looking up the locality on a map, we saw that it was in the extreme eastern part of the State, not far from the Rhode Island border. Later a well-known collector spoke of being a member of a club (from the very city in which the museum is located) which had visited the locality and obtained a number of nice minerals from its trap rock quarry.

One Sunday morning we headed for Plainfield, Conn., driving across the entire length of the State but when we reached the site, an attractive village of 8,000 population (1930 census), we found to our dismay and keen disappointment that neither a quarry nor any minerals were known in the area. No one of whom we inquired ever heard of a quarry around Plainfield—some were positive there was no quarry and especially in traprock, a formation not present in that area. Completely crestfallen, disappointed and very much puzzled, we turned around and headed for home. On the way back we happened to pass through the city of New Britain and recalling that a traprock quarry was in its vicinity (one which we had never visited), we decided to pay it a visit to compensate us for our wild goose chase. We made inquiries as to the quarry's location and were told that it was about 2 miles south of New Britain near the village of Plainville. The quarry was easily reached —it was a huge working and alongside the main highway. A number of interesting minerals were found, including prehnite.

On the way home we began to think over the events of the day when the thought struck us that *Plainville* was the locality we wanted all the time and not Plainfield. The collector who had donated the prehnite specimen to the museum apparently gave the wrong name for the locality; later the club, without checking on the name, also labelled the locality incorrectly. Plainfield and Plainville are approximately 50 miles apart.

WITH OUR DEALERS

The Beau-Mont Industries of Gardiner, Me., recently sent out a new price list (Spring 1941). Though it is only a 3 page typewritten list, it does feature a large number of interesting New England minerals, most of which are from Maine. The specimens are very attractively priced—10c, 15c and 25c each.

The Dekro Mineral Co. of Philadelphia, Penn., recently obtained some excellant specimens that were urgently needed to fill some gaps in their large stock. The contact was made through ROCKS AND MINERALS.

Another, and a particularly fine lot of choice dioptases from Tiger, Arizona, was recently received by Schortmann's Minerals of Easthampton, Mass. Their first lot was a complete sell-out. These very showy emerald-green specimens make ideal micro-mounts. Another recent addition contained some of the finest American calcites—excellent groups of sharp terminated white and very pale pink-tinted xls make these some of the showiest of specimens.

A new locality for agates has been found recently in southwestern Texas by the proprietor of Golden Agates of San Antonio, Tex. These agates cover a wide series of designs and colors and will prove very popular when placed on the market.

Unique and most attractive is Mark M. Foster's fluorescent novelty box which was advertised on page 145 of the April, 1941, ROCKS AND MINERALS It consists of about 300 small chips and fragments of fluorescent minerals affixed to a fibrous wall board and laid out in attractive designs arranged for color harmony and symmetry. The wall board is set in a pleasing gold-colored 5 x 7 x 1 inch cardboard box. Mr. Foster's temporary address is Route 8A, Cedarville, Calif.

Warner & Grieger of Pasadena, Calif., have recently issued an 8-page catalog devoted entirely to lapidary equipment and supplies. It is profusely illustrated. This West Coast firm carries one of the largest and most complete line of lapidary supplies in the country.

John A. Grenzig of Brooklyn, N. Y., is preparing for the summer rush with a large stock of new minerals, including 1,000 small specimens which are being offered at very low prices.

A. J. Alessi of Lombard, Ill., is another dealer who is preparing for a brisk trade during the summer months. He, too, is stocking up with large supplies of new specimens.

NEW ENGLAND NOTES

(*Continued from page* 215)

half-way up the west side of the quarry wall and are dumping everything but the mica back into the lower part of the open pit and I doubt if we will see any new material on the dumps this season.

Chester, Vt. Due to a bad slide at the talc mine, an enormous amount of material has been taken out and placed on the dumps and still as much more will have to be taken out. Talc in many forms is abundant in fine specimens. Actinolite in masses of long blades up to 8" are there by the ton. Magnetite octahedrons in talc and prochlorite are plentiful and were found up to ¾" in diameter. Pyrite cubes were conspicuous by their absence. Ankerite in fine white and yellow transparent rhombohedrons were quite plentiful in prochlorite and talc. Talc after actinolite in white fibers in dark prochlorite make interesting specimens.